Response of Marketed Surplus of Foodgrains

to the Price-Ratio Between Foodgrains

and Manufactured Consumer Goods:

some cases from India

by

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The flow of marketed surplus of foodgrains is a major limiting

factor in the process of industralization in India, with her near-

stagnant export earnings and the need for large imports of capital

goods and intermediate materials (leaving little scope for commercial

import of foodgrains). India has, of course, been able to import

since 1956 large amounts of cereals with relatively small expendi-

ture of foreign exchange because of the U.S. farm surplus disposal

programme under PL 480. Such imports may not, however, be a

substitute for implementing the measures necessary for raising

production and the marketed proportion of production, particularly

in the vast rice growing and rice consuming regions of the country

inthe east and in the south. Given the likely rise in grain production,

the need for raising the marketed proportion of production is getting

more general and urgent as the conditions for depending on grain imports

become unfavourable.

As a major part of production and marketed surplus of foodgrains

in India is accounted for by large cultivators (those with 5-10

acres and above, depending on soil conditions), and as there is a

growing seepage of wants for manufactured consumables from the urban

to the rural areas, marketed surplus of the agricultural sector is

likely to rise on its own with rise in grain production, even if it

declines for cultivators in some of the lower size-classes. But this

may not be sufficient. The marketed proportion of production has to rise enough to meet the requirements of the planned industrial programmes and of the growing non-cultivating population.

There is some indication that rise in food grain production in the recent past did not lead to a corresponding rise in the marketed proportion of production, that the retention by the agricultural sector increased at least as rapidly as the rise in grain production itself. No direct information is available about the volume of aggregate marketed surplus. Available data on marketed surplus are grossly inadequate and varying, over time and space, in the degree to which they can be taken to represent the aggregate situation. However, the total surplus marketed by the agricultural sector may be calculated indirectly. From (a) the census figures for agricultural and non-agricultural population, (b) the National Sample Survey figures for per capita consumption in the rural and the urban sector, and (c) figures of net Government distribution of cereals (all of it normally for the non-agricultural sector) out of current imports and carried-over stocks, it is possible to calculate the total volume of cereals consumption in the non-agricultural sector out of current domestic production. This may be assumed to be approximately equal to the marketed surplus of cereals of the agricultural sector (covering the cultivators and the landless agricultural labourers).[1] Calculated in this rough and

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[1] This assumes the percentage change in <u>private</u> stocks of cereals to be nil between these two years. Both 1953-54 and 1961-62 were agriculturally normal years preceded by equally normal years. (Con't on next page).

indirect manner, the marketed proportion of net cereals production
rose little from 1953-54 to 1961-62, both of which were good years in
terms of rainfall and between which cereal production increased by
about 16 p.c.

Cereal consumption by the non-agricultural population during
these two years is obtained as follows. According to 1951 census,
17.3 p.c. of total population was urban, 86 p.c. of urban population
was non-agricultural, and 18.5 p.c. of rural population was non-agricul-
tural. Applying these percentages to the average of the mid-year
population for 1951 and 1952, total non-agricultural population may
be estimated at 110.6 million in 1951-52. According to 1961 census,
18 p.c. of total population was urban, 92.8 p.c. of urban population
was non-agricultural, and 19.95 p.c. of rural population was non-agricul-
tural. Applying these percentages to mid-year population figures for
1961 and 1962, we get an estimated non-agricultural population of
148.3 million for 1961-62. This gives a compound annual rate of
growth of 3 p.c. between 1951-52 and 1961-62. Using this rate, the
estimated non-agricultural population for 1953-54 is 117.34 million.

From National Sample Survey, per capita consumption of cereals in

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Hence, this assumption may be less implausible, or may matter less,
for these two years. Moreover, our purpose here is to find the change
in the marketed proportion of cereal production between these two
years. For this purpose, a much weaker assumption would do, viz.,
that the proportionate difference between marketed surplus and the
amount consumed by non-agricultural population (net of Govt. supply
out of imports or stocks) was unchanged as between these two years.

1953-54 (7th round) was 16.65 Kg. for the _rural_ and 12.95 Kg. for
the _urban_ sector for a period of 30 days; the corresponding figures
for 1961-62 (17 round) were 16.67 Kg. and 12.50 Kg. respectively.
As these figures are not available for the non-agricultural population
separately, we have used two alternative figures of per capita consump-
tion for the _rural_ part of the non-agricultural population: one
relating to the urban sector and the other relating to the rural
sector.[1] We get two estimates, accordingly, of total cereals consump-
tion by the non-agricultural population. After deducting from this
net Government distribution (total Government issue of cereals minus
current internal procurement by the Government),[2] the estimated range
for the amount of cereals consumed by the non-agricultural population
that was currently received from the agricultural sector in the
country is: 16.9 to 19.5 million tonnes in 1953-54 and 18.9 to 23.5
million tonnes in 1961-62.

Expressed as percentages of net cereals production (net of seed,

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[1]In the census of 1951 as well as of 1961, the non-agricultural
population is distributed in almost 50:50 ratio between the rural
and the urban sectors. The use of rural per capita consumption figure
for the rural part of the non-agricultural population thus amounts
to using the arithmetic mean between the rural and the urban per
capita consumption figures for the entire non-agricultural population.

[2]For this we use, in the absence of more precise information,
the average of net Government distribution of cereals in 1953 (1961)
and in 1954 (1962) for 1953-54 (1961-62).

feed, and wastage, at 12.5 p.c. of gross production) of the respective

years, these figures amount to 31.56 p.c for 1953-54 and 30.41 p.c.

for 1961-62, if we use the NSS per capita urban consumption figure

for the entire non-agricultural population; and 36.49 p.c. for 1953-54

and 37.91 p.c. for 1961-62 if we use the per capita rural consumption

figure for the rural part of non-agricultural population.

Between 1953-54 and 1961-62 though cereals production rose by 16.2 p.c.

as a whole and by 3-4 p. c. as per head of agricultural popula-

tion, the marketed proportion of production – from our calculation with

NSS data – failed to rise in any significant way and might even have

declined.

The Fourth Five Year Plan accepts the objective of achieving

self-sufficiency in foodgrains by 1970-71. For the Plan's programmes

of industrial production and the target for per capita income to be

fulfilled without import of cereals and without much rise in food

price, the marketed surplus of cereals available for consumption by

the non-agricultural population would have to rise to at least about

35 to 41 million tonnes in 1970-71,[1] corresponding to the figures

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[1]These figures are calculated in the following manner. Total
population for 1970-71 is 560 million, as projected by the Planning
Commission. If one assumes taht during 1961-71 urbanization would
take place at the same rate as experienced during 1951-61, then urban
population in 1971 may be projected at about 105 million. It would
be more realistic to assume a larger rate of urbanization during the
sixties. The figure of 112.5 million as projected by National Council
of Applied Economic Research (Occasional Paper, no. 19, pp. 19-20)
seems more realistic. This gives a projected rural population of 447.5
million. Assuming the percentage of rural population primarily

18.9 to 23.5 million tonnes respectively for 1961-62. The lower figure holds if the non-agricultural population in the rural sector consume no more of cereals than their urban counterpart. The higher figure holds if (as is more likely) their consumption equals at least the average for the rural sector.

The target for gross foodgrain production in 1970-71 is placed at 115-120 million tonnes by the Planning Commission, out of which cereal production may not be more than 100 million tonnes. Allowing for seed, feed, and wastage, net cereal production that is targeted for 1970-71 is not more than 87.5 million tonnes. Even if this target is achieved, the marketed surplus of the agricultural sector would have to be at least 40-47 p.c. of net cereal production (the

dependent on agricultural income to be 5 (i.e. slightly smaller than in 1961), projected total non-agricultural population for 1971 is 196.4 million.

At 1960-61 prices, per capita income for the non-agricultural population was Rs. 511.80 in 1961-62 and is likely to be Rs. 676.68 in 1970-71, if the targeted 31.5 p.c. rise in agricultural production in 1970-71 as compared with 1964-65 is achieved (Source: based on figures from Fourth Five Year Plan, a Draft Outline; pp. 3, 39). This implies a compound rate of growth of 3.1 p.c. Assuming their income elasticity of demand for cereals to be between 0.3 and 0.5, the projected compound rate of growth in demand for cereals by the non-agricultural population between 1961-62 and 1970-71, is .95 to 1.55 p.c. Applying these rates to the 17th Round figures, one can project per capita demand for cereals consumption by the non-agricultural population in 1970-71.

Total consumption of cereals by the non-agricultural population in 1970-71 that may be projected from this is 34.9 million to 41.4 million tonnes. This gives the minimum requirement of marketed surplus by the agricultural sector, in the absence of grain import or large buffer stocks.

If we consider 105 million as the projected urban population, then the projected total non-agricultural population in 1970-71 is smaller, about 191 million. By using this figure, total cereal consumption by the non-agricultural population in 1970-71 may be projected at 31.8 million to 40.9 million tonnes.

required percentage would be nearer the upper limit if, what is more likely, the rural non-agricultural people consume more than their urban counterpart) in order to enable the country to go without imported cereals and to implement the industrial programmes without much rise in food price. If net cereal production does not reach this target, then Indian cultivators may be required to market an even larger proportion of the net produce.

It is difficult to say, a priori, whether the planned or the expected rise in production alone would generate the required increase in marketed proportion of production, or whether there would have to be supplementary tax measures or price policy. It is necessary to find out how responsive marketed surplus is to changes in production, prices, and some other variables, the nature of these response coefficients, and how they vary from one region of the country to another. Available data on sales or marketed surplus of foodgrains are more scanty and unsatisfactory than most other agricultural statistics of India. Yet the questions are important enough to justify careful use of whatever data are available at the moment. From a study of the available sources, it seems that the imperfections of the data become less serious as one gets down to more disaggregate levels. Partly for this reason and partly because the respone of marketed surplus to various factors is likely to be non-uniform as between different regions of the country depending on the economic condition of the cultivators and the cropping pattern, we have attempted a regional, partly disaggregative, analysis.

II

Our objective here is to study the conditions under which it might be possible, at least theoretically, to raise simultaneously the marketed surplus of foodgrains and the savings ratio of the foodgrain growers by means of price policy. An increase in grain production per head of the relatively prosperous cultivating households gives rise to a saving potential. This may be partly motilised if their per head total consumption (of foodgrains and manufactures) is held back from rising as much as it otherwise would (given their income elasticities of demand for grains and the other consumables). One way of mobilising this surplus would be to raise the prices of manufactured consumables purchased by these cultivators relative to the price of foodgrains, provided that the marketed surplus does not decline (as it did in the U.S.S.R. during the 'Scissors Crisis') in response to this change in the price ratio. This involves a considerable amount of selection of regions and the manufactured items to be taxed. There may be other means that can possibly serve this dual purpose of raising marketed surplus and mobilising savings potential of richer cultivators. One method is an intensive and progressive system of direct agricultural taxation. Another is requisitioning of all assessed surplus of grain from the cultivators. In India neither of these methods has as yet been employed to any significant extent. The agricultural sector in India is taxed too

little and at too small a degree of progressiveness as compared with the rest of the economy.[1] Compulsory requisitioning of assessed surplus of cultivators (or the excessive stocks of traders) has not been widely used in India. Even during the peak of post-War foodgrain control, requisitioning orders were not issued except as a last resort and for a short while. In Madras, Mysore, Bombay and Kerala procurement was made from cultivators on a compulsory basis sometimes during the period 1947 - 1952, but hardly in practice did it turn out to be compulsory requisitioning of the entire assessed surplus of cultivators. Intensive use of compulsory procurement is unlikely to be either feasible or fruitful in the Indian context. Procurement in India, whether voluntary or compulsory, is by itself unlikely to raise the marketed proportion of production though it may increase the extent of Government control over the given marketed surplus.

It is difficult to say whether selective manipulation of relative prices between foodgrains and purchased manufactures is more feasible - politically and administratively - or not than implementing a really progressive system of agricultural taxation or an intensive procurement system. All we intend to do here is to find whether there is any empirical basis for a hypothesis regarding the conditions under which

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[1] On this see, A. Mitra, 'Tax Burden on India Agriculture', in Braibanti and Spengler (eds.), Administration and Economic Development in India; P.K. Bardhan, 'Agriculture Inadequately Taxed,' The Economic Weekly, December 9, 1961; V.P. Gandhi, Tax Burden on Indian Agriculture, Harvard Law School, 1966.

marketed surplus of richer cultivators may be negatively responsive to changes in grain price relative to purchased manufactures.

Hypothesis:

Our hypothesis is that (a) if in a region foodgrain production is significantly in excess of consumption requirements of the cultivating households, (b) if a major part of this marketable surplus is accounted for by better off cultivators (with holdings above 5-10 acres, depending on soil), and (c) if the cultivators have been more exposed to seepage of wants from the urban sector - either because of their proximity to cities or because of better transport conditions, then a rise in prices of purchased consumer goods relative to foodgrains may -- (d) given an unchanged income from _other_ crops -- raise the marketed surplus. Condition (a) excludes not only subsistence cultivators and regions (e.g., many parts of Rajasthan with small grain production) but also the cases (e.g., most parts of Gujarat and Maharashtra) where though the cultivators are rather prosperous, their prosperity is based on production of crops like cotton, oilseeds, and sugarcane.

Where all of the three primary conditions are satisfied, but commercial crops account for a considerable portionof total farm income, a decline in foodgrain price relative to purchased consumer goods even with the right elasticity condition, may not raise the marketed surplus if there is a rise in the output of commercial crops and/or in their prices relative to foodgrains. For, rise in income from the purely

cash crops would enable the cultivator to consume more of both food-
grains and other consumables even if there has been no rise in grain
output. Apart from this short run effect on marketed surplus, a rise
in prices of cash crops relative to foodgrains would eventually affect
also the production of foodgrains. From this it follows that the
policy maker in order to raise marketed surplus and cultivators' savings
ratio in a region where commercial crops are important, would have to
hold the price-ratio between foodgrains and commercial crops (P_f/P_c)
constant. In an actual situation where commercial crops are important
in the cropping pattern and where no such price policy has been followed,
P_f/P_c may be changing a lot and causing changes in marketed surplus
through grain production. In this situation, for estimating the
response of marketed surplus to the price ratio between foodgrains
and purchased consumables (P_f/P_i) by means of using observed data one
would have to include the relative price (or value of production) of
commercial crops as an independent variable. One would also have to
know the coefficient of response of grain output to P_f/P_c in each of
the cases (which are districts in the following section) studied.
this would be an impossible task in view of the lack of all the
required data.

In this situation in order to isolate the impact of changes in
P_f/P_i on the marketed surplus of foodgrains, we have concentrated
mainly on those regions in which foodgrains predominate the cropping
pattern and other crops are unimportant.

One may wonder whether, even if the effect of changes in P_f/P_c is unimportant in a predominantly foodgrain growing region, changes in P_f/P_i might have any impact on production. There is little empirical evidence in this respect. It does not seem very improper to assume that grain production, though significantly responsive to changes in their price relative to competing commercial crops (P_f/P_c), may be expected to be generally non-responsive to changes only in the ratio between foodgrains and purchased consumables.

[In this connection, some might argue that a rise in price of purchased items (P_i) might lead the cultivator to curtail his production and take out more leisure. But this does not seem very likely in the present Indian context (except for the very backward regions with poor transportation) in view of the growing importance of the new manufactures among large and medium cultivators.

Apart from this, to assume that agricultural production responds - in the short run - to changes in the price-ratio between agricultural and manufactured commodities is to assume short-run mobility of resources, especially capital, between the agricultural and the non-agricultural sector which is not the case in India. There is evidence of some mobility of trade credit from urban to rural areas - but not of production credit to any significant extent.]

For a predominantly foodgrain growing region then the marketed surplus equation of the cultivating household may be defined as

$$S = O_f - C_f (O_r, P)$$

where S and O_f are the marketed surplus and the production of foodgrains respectively, $P = P_f/P_i$ (price ratio between foodgrains and purchased consumption goods): and O_r is the total real income of the household which is equal to $O_f P + u O_r$, u being a small (assumed to be constant) proportion of total income arising from sources other than grain

production in the case of this predominantly grain growing cultivator.

[For the cultivators in a region taken together, it might in some cases be a better assumption to take uO_r - rather than u - as constant. But it can be checked that this alternative assumption does not change our subsequent conclusions about the sign of the price elasticity of marketed surplus.]

From the marketed surplus equation above, the elasticity of S to changes in P ($= P_f/P_i$) is given by

$$e_{sp} = \frac{dS}{dP} \cdot \frac{P}{S} = -\frac{P}{S} \left[\frac{\partial C_f}{\partial P} + \frac{\partial C_f}{\partial O_r} \cdot \frac{dO_r}{dP} \right] \quad .$$

From total real income defined for a predominantly grain growing cultivator as $O_r(1-u) = O_f P$, one gets $dO_r/dP = O_r/P$.

Hence,

$$e_{sp} = -\frac{C_f}{S} \left[e_{fa} - \sigma_{fa}\right], \ldots \quad (I)$$

where σ_{fa} is the price elasticity of cultivators' demand for foodgrains measured as positive and e_{fa} the corresponding income elasticity.

A decline in P_f/P_i would raise S if $e_{fa} > \sigma_{fa}$.

Krishnan[1], using a marketed surplus equation which in our notation is $S = O_f - C_f(P_f, O_f \cdot P_f)$, obtained an expression for e_{sp} which is very similar to ours except that we have considered P_f/P_i rather than P_f alone. From income and (own) price elasticities (measured as positive) of demand for foodgrains in the rural sector as estimated

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[1]T.N. Krishnan, 'The Marketed Surplus of Foodgrains: Is It Inversely Related to Price?'; The Economic Weekly, Annual Number, February 1965.

by himself on the basis of National Sample Survey of consumer expenditure, and from the assumption (based on Rural Credit Surveys) that 35% of foodgrain output is sold by the cultivators, Krishnan obtained an e_{sp} (all-India) equal to -0.3. Raj Krishna[1] also considers the absolute level of grain price (P_f alone). But he introduces an elasticity coefficient of foodgrain output with regard to changes in its price (i.e., he considers O_f as a function of P_f) though for this elasticity he uses as a proxy the elasticity of grain production to changes in the price-ratio between foodgrain and the competing crops. With O_f regarded as a function of P_f, the sign of e_{sp} then comes to depend on whether or not the price elasticity of production outweighs the price elasticity of consumption. His conclusion is that the sign is likely to be positive. But if one is either interested in a short-run marketed surplus model (as in some of the cases studied in Section III for which a two-year period is considered), or if ond wants to find the price response of marketed surplus when either (a) foodgrains enjoy overwhelming importance in the cropping pattern (as in many of the cases studied below) or (b) though commercial crops are important the price-ratio between foodgrains and these crops is held constant by the policy-maker, then it can be shown that even in terms of the values of the parameters assumed by Raj Krishna himself e_{sp} is more likely to be negative.

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[1]Raj Krishna, 'A Note on the Elasticity of the Marketable Surplus of a Subsistence Crop', Indian Journal of Agricultural Economics, July-September, 1962.

In terms of expression (I) above and the plausible ranges of values

for the parameters (e_{fa} = 0.6 to 0.8, σ_{fa} = 0.2 to 0.4) based on data from

National Sample Survey, and assuming C_f/S for all-India to range between

2.1 to 2.4[1], e_{sp} seems to range between -0.2 to -1.1. This is very

rough and aggregative.

Such aggregative estimates of e_{sp} based on cross-sectional consumer

expenditure data for the rural sector as a whole is likely to be of

limited use in indicating the specific regions or groups of cultivat-

ing population where there may be some scope for raising marketed

surplus and savings ratio by means of price policy. In the absence

of disaggregative estimates of income and price elasticities of demand

for foodgrains in the agricultural sector, we have tried in Section III

of our study to estimate, directly, the price-response of marketed

surplus for some specific cases where we expect - on some empirical

and a priori grounds - this response coefficient to be negative and also

where there is likely to be some mobilisable surplus.

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[1]According to estimates made by Directorate of Marketing and
Inspection, Ministry of Food and Agriculture, relating to 1955-56 and
1956-57, marketable surplus as a proportion of production is 31%
for rice, 33% for wheat, and somewhat smaller - around 25% - for
other cereals. The weighted average comes to 30-31 p.c. Assuming
that C_f stands for all grain retentions, C_f/S then comes to 2.2 to 2.3.
As is apparent, this is a very rough figure, first, because the
Ministry of Food and Agriculture esimate relates to marketable rather
than actually marketed surplus, and, second, because C_f is assumed to
cover all retentions. We have to refer to the estimate by Ministry of
Food and Agriculture, in the absence of any alternative one. Our
estimate of marketed surplus in the introductory chapter relates to
the agricultural sector as a whole (covering cultivators and agricultural
labourers) rather than cultivators only, and hence appears somewhat smaller.
In view of the two shortcomings mentioned above in the footnote, we
have assumed a somewhat wide range for C_f/S.

The Data and Their Limitations

For testing the hypothesis we intend to use the data on arrivals from villages and prices of grains at selected wholesale assembling markets as collected by the Ministry of Food and Agriculture. These are the only time-series data available on marketed surplus. The limitations of the data make it a rather difficult task requiring much of careful selection.

One limitation is that with the market arrivals data available up to now it is not possible to consider a sufficiently large number of cases such as is necessary for deriving policy conclusions. We had to leave out a large amount of the data because of large gaps and apparent inconsistencies.

A more important limitation concerns the coverage of market arrivals data. They relate only to some of themajor assembling markets. They do not cover the direct distribution (at village site or on way to the wholesale market) from cultivators to consumers, retailers or even millers. If the relative proportions of marketed surplus directly distributed and passing through the wholesale markets respectively remained unchanged from year to year, this would not be a problem as long as one is concerned with changes in marketed surplus, prices, output, and not with the absolute volumes. But they may not remain unchanged. An abnormally good harvest may raise the proportion directly distributed, if the capacity of the market to handle a bigger than average crop is limited. What is more serious is that attempts

on the part of the Government to hold down the market price or impose

levy on dealers and cultivators at artificially reduced price often

lead to some dispersal of transactions away from the organised whole-

sale marketing centres, thus reducing market arrivals even if total

marketed surplus is unchanged. Or it may lead to increased with-

holding of stocks (in expectation of eventual withdrawal of the control)

and consequent reduction in the total volume and the pace of the

marketed surplus itself. When price control and procurement measures

are adopted   at the wholesale markets and are sporadic or ad hoc,

the resulting diversion or disruption of the flow of market arrivals

makes it nearly impossible to infer the changes in marketed surplus

from the market arrivals data. The only solution is to be careful

about the selection of cases and periods. The problem is not serious

for cases where the Government purchase price was not enforced as a

statutory maximum,where these purchases though at a fixed price were

on a voluntary basis. This was the case in most of the surplus districts

of surplus states (e.g., Raipur, West Godavari, Balasore, Sambalpur

and also Tanjore studied below). For these cases the procurement price

generally served as a minimum rather than a maximum. This problem is

relatively unimportant also in the wheat markets of Punjab because

of the system of pre-emptive Government purchases at market price.

For these cases as well as for others (like the surplus districts

of West Bengal) the period from 1960 to 1964 is relatively free of the

problem mentioned above. For,this was a period when multi-state rice

zones were in operation; restrictions over movements of grains from surplus to deficit areas and price control measures were relatively moderate, and procurement operations were on a relatively more voluntary basis than, say, in 1965-66.[1] Hence, for this period market arrivals data may be taken to be more indicative of changes in marketed surplus (of the cultivators in the hinterland of the market) than for any other period in recent years.

Another problem of using market arrivals data is that the hinterland of the market centres in a specific area cannot be delimited clearly for the purpose of relating marketed surplus to production of that area. Production data (time series) are not available at smaller than the district level. Even if one has data regarding arrivals at all the primary assembling markets in the district, and even if there is no problem of diversion of sales to unorganised, smaller markets, one still is not sure of not being off the mark in trying to relate the changes in arrivals at the district markets with those in the district production level. In the boundary areas at least selling by the cultivators may not be confined to the district markets, and there may be some overlapping of market arrivals and hinterland areas as between neighbouring districts. Under normal price conditions, the degree to which the cultivators in a particular district sell in

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[1]For this reason we have not used the market arrivals data for 1965-66, although we had access to them.

the markets of neighbouring districts is likely to be smaller if the
markets within the district are spread out rather than concentrated
at the centre or in one part of the district. For most of the districts
studied below, the selected assembling markets are spread out; and for
this reason the extent of overlapping of hinterland with neighbouring
districts may be less important in their case.

The overlapping of hinterland in itself may not always be a
serious problem if one is interested in the proportionate change in
market arrivals out of a district's production, and not in its volume.
Unless there is an exceptionally large rise in production or excessive
price control in a district, which reduces its grain price in relation
to the prices in markets of neighbouring district, there is no reason
why the extent of overlapping of hinterland should rise of decline much
from one year to another.

It seems that with some care about the selection of cases and of
periods, the limitations of using market arrivals data for indicating
proportionate changes in the marketed surplus of a district may be
rendered much less serious than they can possibly be.

The estimates of price and output elasticities of marketed surplus
that are attempted in this section are subject to two other limitations.
One is that because of lack of data - at the district level - on
prices paid by cultivators for purchased inputs, it has not been
possible to separate out their effect on marketed surplus. In other
words, the estimated elasticity of S to changes in P (price of grains

relative to purchased consumer goods) also incorporates the effect

of changes, if any, in prices of purchased inputs.

The other limitation is that rural retail prices for purchased

consumer goods not being available at the district level, we have

used for P_i an index of prices paid by cultivators (for consumption

purchases) in the state to which the district belongs. This index

is obtained from figures of statewise rural retail prices of clothing,

footwear, sugar, edible oil, and kerosene oil. The weights used for

averaging them are taken from NSS consumer expenditure data for the

rural sector of the zone to which the state or the district belongs.

This index may not be more than a rough approximation.

Models for Estimation or Calculation of Response Coefficients

In view of the limitations of the marketed surplus data and

the small number of years for which they are available, we have used

the following simplified marketed surplus models -- (a) one with only

current output and prices, and (b) the other with an additional

variable representing cultivator's price expectation. These are

described below. The limited nature of the data do not permit

the use of more sophisticated models.

(a): The quantity of foodgrain that the cultivating households

in an area are in a position to market during a given year is given by the output of grains minus grain consumption by the households and the volume of payments in kind to hired labour, etc. (For an individual cultivator what matters is the total receipt of grains, including those received as kind rent and not just current production. But for all the cultivators in a village or a district put together, these other receipts of grains would mostly cancel each other out.) For small peasants, consumption of grains is quite often a residual determined by their cash or kind commitments. We shall put their case aside, for small peasants' share in total output and marketed surplus of grains is very small in most of the cases studied here.

Can one assume the proportion (β) of grain production used for payments in kind in a particular area to be constant over 5 years? One may do so on the ground that it is largely determined by institutional conditions of that area, conditions of transport and marketing, and distance from the city and the market. However, even during such a short period a less-than-unity elasticity of labour employment with respect to production may make β decline with rise in O_f, and changes in foodgrain price may induce the cultivator to seek substitution of kind payments for cash payments or _vice versa_. Since not much is known about the quantitative importance of these two factors, the model has to be defined in terms of total retention of grains by the cultivating household, so that the output and the price elasticities of marketed surplus are unaffected by whether kind payments form a

constant proportion of grain production or not.

With C_f as total retention, the marketable surplus equation,
in a situation where cash crops other than grains are of very minor
importance, may be of the form, $S = O_f - C_f(O_r, P)$, in which
$P = P_f/P_i$ and $O_r = O_f P + u O_r$, u being a constant and small proportion
of total real income that comes from sources other than foodgrains.
As the rate of change in O_r in this case is approximately equal to
the rate of change in $O_f P$ and as O_f is unlikely to be affected by change
in P alone (with prices of inputs and competing crops relative to
foodgrains unchanged), the marketable surplus would be a function simply
of current year's O_f and P. This would also be the marketed surplus
function if in a particular case changes in grain stocks of cultivators
due to changes in expectation about price and Government control
measures are unimportant. When these expectation changes are not
unimportant this simple model would not be able to explain a major
part of observed variation in marketed surplus.

(b): In order to take account of the possible influence of
price expectation for next year on current year's marketed surplus,
we have used a simple behavioural equation of the form
$S_t = a + b_1 O_{f,t} + b_2 P_t + b_2 P_{t+1}/P_t$, where P_{t+1} refers to next year's
price ratio (P_f/P_i). What is the right indicator of expected price
is surely debatable. One plausible assumption seems to be that the
price expectation formed during the current marketing year about the
next one is usually fulfilled. This gives P_{t+1}/P_t as an indicator

of expected price relative to current price. This assumption seems
plausible because in the course of the current marketing year (which
extends from harvesting of the currently marketed crop to the eve
of harvesting of the coming crop) crop prospects for the next year and
the nature of likely Government actions in the grain markets become
more or less clear. Barring a sudden change at the late stage in
weather or in Government control measures, cultivators' price expecta-
tions formed during the current marketing year is likely to be
realised in the next.

Systematic collection of market arrivals data started in 1960-61,
and we do not have observations for more than five years for any of
the cases studied here. With five observations the first model may
be used for estimating regression coefficients that may be regarded
as more a way of summarizing the data than of much predictive or extra-
polative value. Even this is not possible when we bring in a third
independent variable for price expectation. For this latter case, we
can solve for the values of the unknown response coefficients that
exactly fit into the observation.

For some of the cases that we intended to study (as they satisfy
the conditions of our hypotheses) market arrivals data could not be
used for five consecutive years. Either they were lacking or else
were characterised by large gaps or inconsistencies. For a district
of West Bengal studied below market arrivals data could be used for
only three years. In their case considering production and price-

ratio as the two explanatory variables as in model (a), we have cal-
culated the coefficients by solving the two equations of percentage
change in marketed surplus as related to production and price ratio.

For a few cases two year data which are somewhat different in
nature from market arrivals data are available. These are derived
from a few small scale surveys of groups of cultivators in a village
or a _tehsil_ within a district as carried out by some of the Agro-
economic Research Centres. Some of these are available for the two
consecutive years 1957-58 and 1958-59.[1] Part of these two-year data
may also be utilised for our purpose by using an expression obtained
as follows.

Let $S(O_f, P = O_f(1-\beta) - C_f(O_r(O_f, P), P)$, in which as before,
β is the proportion of grain production used for payments in kind
(for a two year period it is assumed to be constant); S, O_f, C_f are
the marketed surplus, output and consumption (or total retention) of
grains respectively, P is the price ratio between grains and purchased
consumables, and O_r the total real income of the cultivator. From
this it follows that

$$\frac{dS}{S} = \frac{dP}{P} \left(\frac{\partial S}{\partial P} \cdot \frac{P}{S} \right) + \frac{dO_f}{O_f} \left(\frac{\partial S}{\partial O_f} \cdot \frac{O_f}{S} \right) .$$

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[1] The Report on Market Arrivals of Foodgrains (1958-59) published
by the Ministry of Food and Agriculture provides some information
about sales behaviour of selected groups of cultivators in the hinter-
land of some markets during 1957-58 and 1958-59 marketing years.
These cultivators were surveyed by some of the Agro-economic Research
Centres.

Now, for predominantly grain growing cultivators $O_r = O_f P/(1-u)$ and hence

$$\frac{\partial O_r}{\partial O_f} = \frac{P}{(1-u)}$$

u being the proportion of income arising from sources other than grain production in the case of these cultivators.

$$\frac{\partial S}{\partial O_f} \cdot \frac{O_f}{S} = \frac{O_f}{S}(1-\beta) - \frac{O_f}{S} \cdot \left(\frac{\partial C_f}{\partial O_r} \cdot \frac{O_r}{C_f}\right) \cdot \frac{C_f}{O_r} \cdot \frac{P}{(1-u)}$$

$$= \frac{O_f}{S}(1-\beta) - \frac{C_f}{S} e_{fa} \quad ,$$

e_{fa} being the income elasticity of demand for foodgrains. Hence,

$$e_{sp} = \frac{\partial S}{\partial P} \cdot \frac{P}{S} = \frac{\frac{dS}{S} - \frac{DO_f}{O_f}\left[\frac{O_f}{S}(1-\beta) - e_{fa} \cdot \frac{C_f}{S}\right]}{\frac{dP}{P}} \quad \ldots(II)$$

This expression may be used for calculating e_{sp} from two-year data.

Before beginning the case studies, one more comment seems due. In deriving the price elasticity of marketed surplus from observed data by any of these methods one may sometimes wonder whether what one may get as the price elasticity of marketed surplus may conceivably be reciprocal of the supply elasticity of price if the foodgrain

market of the district as a whole happens to be imperfectly competitive.
However, the problem may not be very serious if the particular district
is (as Tanjore, Raipur, West Godavari, Ferozepur, Chingleput, Balasore,
Karnal and Birbhum studied below are) surplus producing, exporting
foodgrains to other parts of the country, and is well connected by
transportation with larger markets feeding the large cities. If a
large part of the marketable surplus flows out of the district, the
effect of changes in supply on the market price of foodgrains in the
district is likely to be less significant than in the case where the
entire supply remains within the internal market of the district. It
may not be unreasonable to regard the cultivators as a group in the
surplus-producing and grain-exporting district more in the nature of
price-takers than price-makers with regard to the particular grain that
has an exportable surplus. We may also note that this problem becomes
less serious as we get down to more micro level. For some of the
cases studied below, the price elasticity is calculated for a small
group of cultivators in the district in addition to that for the
district as a whole.

Case Studies

We shall first take up some of the cases which satisfy the condi-
tions specified earlier: (1) a substantial grain surplus, (2) the major
part of this surplus concentrated in the hands of better off cultivators,
and (3) good transportation and proximity to city and markets leading

to considerable seepage of wants from the urban sector - and which

are also predominantly foodgrain growing. Towards the end of this

section we shall consider some contrasting cases which do not satisfy

some of the three primary conditions and/or are characterised by

large and growing importance of non-foodgrains in farm production.

Tanjore District, Madras :

More than 85 per cent of total sown area of Tanjore is accounted

for by paddy, of which three crops are raised during a year and at

least one (viz. Kuruvai) is almost entirely sold and exported to other

districts. Production of other foodgrains and of non-foodgrains

(excepting green manure crops) is minor. Cultivator's income - total

real as well as cash - is derived almost entirely from paddy.

The volume of surplus of paddy and rice generated by the district

is substantial. According to a marketing survey of Tanjore[1] by the

Department of Food and Agriculture, rural surplus of paddy (after

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[1]Report on the marketing of Agricultural Produce in Thanjavur
District, (mimeographed): Directorate of Marketing and Inspection
(Department of Food and Agriculture). Nagpur. The estimated surplus
in terms of rice for rural Tanjore was 389 thousand tons in 1958-59
which was about 46 per cent of production. In 1962-63, it was 462
thousand tons, i.e., 50 per cent of production. Rice production
itself rose by 9 per cent between these two years. For 1960-61
to 1962-63, the estimated rural surplus in terms of rice was
468 thousand tons. This is remarkably close to NCAER's
estimate of rural surplus of Tanjore during 1960-63
[A Strategy for Agricultural Planning; National Council of Applied
Economic Research; p. 92]

allowing for requirements of seed and rural consumption at the rate

of 16 ozs. of rice per head per day) was around 50 per cent of production

during the period from 1958-59 to 1962-63. After meeting the consump-

tion requirement of the urban population of the district (which

was 20-5 per cent of its total population in 1961), the estimated

exportable surplus ranged from 35 to 40 per cent of paddy production

during this period. The surplus actually released by the district

or by its agricultural sector might have diverged from these percentages

depending, among other things, on price of paddy relative to other

consumer goods.

As regards the distribution of the marketable surplus as also

of total production of paddy among different size-classes of cultivators,

some idea may be obtained from the size-distribution of cultivated

area. A recent survey[1] of 36 IADP blocks of Tanjore (covering 65

per cent of gross cropped area of the district) indicates that about

61 per cent of cultivated area and 25 per cent of operational holdings

belonged to the size class of '5 acres and above' which may be taken

to cover medium and large cultivators in the case of Madras and more

so in the high productivity district of Tanjore. These percentages

are not much different from those for Madras as a whole.[2] However,

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[1] Intensive Agricultural District Programme, Second Report (1960-65) (mimeo.) p. 131. Prepared by Expert Committee on Assessment and Evaluation, Ministry of Food and Agriculture.

[2] According to 16th round of NSS data (relating to 1959-60), the percentage of cultivated area accounted for by holdings of five acres and above is about 60 per cent in Madras State.

These purchases were used for recovering the cooperative credit granted earlier for production purposes. As procurement was not accompanied by statutory maximum price or any other form of price control, or restrictions over market transactions, it is unlikely to have affected the proportion of total marketed surplus arriving at the mandis.

The index numbers (with 1960-61 = 100) of total market arrivals from villages and the average price of paddy for eight assembling markets of Tanjore are given below along with the changes in production of paddy in the district. The absolute figures are in the Appendix, Tables 1-2. The index for P_i is based on rural retail prices of clothing, sugar, groundnut oil, and kerosene oil in Madras State averaged by using their relative weights for rural consumers of South India (from National Sample Survey data).

	S	O_f	$P (= P_f/P_i)$	P_f	P_i
1960-61	100.0	100.0	100.0	100.0	100.0
1961-62	106.4	111.4	104.4	99.3	95.1
1962-63	122.6	99.9	85.5	92.2	107.8
1963-64	100.9	92.3	95.4	111.6	117.0
1964-65	109.2	107.8	87.7	102.8	117.2

For these five years and with current output and current price ratio as the only independent variables, the least square linear

estimators are given by S=141.7 + .318 O_f −.819 P (R=.727).[1]

Corresponding to these, the elasticity of S with regard to O_f is

+.302 and with regard to P − .719.

When we introduce an additional price expectation variable

(P_{t+1}/P_t), the unknown coefficients of a simple linear equation

consistent with the given observations may be calculated from the 4

derivative equations for year to year changes. Thus calculated, the

marketed surplus equation for 1960/61 − 1963/64 is given by

$\hat{S}$ = 168.8 + .998 $\hat{O}_f$ − 1.612 $\hat{P}_t$ − .071 (P_{t+1}/P_t) — $\wedge$ indicating

percentage change − for the four variables measured as percentage

differences from the initial year so that the coefficients are the

constant elasticities.

For the set of observations considered above, grain sales are

thus positively responsive to changes in grain output, negatively

to those in price of grains relative to purchased consumer goods,

and negatively to changes in the expected level of this price ratio

as compared with its current level. The response to expected price

changes is of a very small order or magnitude, however.

Raipur District, Madhya Pradesh

Paddy is the most important crop in this district, covering

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[1] Regression estimates in this and the following cases are employed
mainly for summarising the given data in view of the shortness of
the time series. Hence standard errors, etc., are not discussed.

about 70 per cent of its gross sown area, more than 85 per cent of

its total foodgrain production, and about 90 per cent of total value

of production of all crops taken together.[1]

The district also generates a large surplus of paddy. The rural

surplus (after allowing for seed and consumption by the rural people -

at the rate of .92 lbs. per capita per day, based on local inquiries)

has been estimated at 46 per cent of rice production in 1959-60[2]

and somewhat larger than 40 per cent for later years.[3] After meeting

consumption requirements of its urban population (which was 11.4 per

cent of total population of Raipur in 1961), the estimated exportable

surplus of the district comes to not less than 35 per cent of rice

produce during this period.

The major part of the district's cultivated area and hence also

of production and marketable surplus of the main crop is accounted for

by relatively prosperous cultivators. For the IADP blocks (covering

58 per cent of gross cropped area of the district), cultivators with

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[1]Marketing Survey of Raipur District. Dept. of Food & Agriculture.
Nagpur. (Mimeographed).

[2]Marketing Survey of Raipur, op. cit. pp. 3-6.

[3]NCAER's estimate of rural surplus of rice in Raipur district
during 1960-63 is about 41 per cent of rice production. The per
capita rural consumption rate used by NCAER for this purpose is 165 kg.
While this normative figure is nearly equal to the figure for Tanjore
obtained from local inquiries, this is not so in the case of Raipur.
The figure obtained from local inquiries in Raipur is smaller than
165 kg. This gives an estimated rural surplus larger than 41 per
cent of production for 1960-63.

operational holdings of '10 acres and above' account for 80 per cent

of cultivated area and 45 per cent of all operational holdings.[1]

Their percentage share in cultivated area is larger than that for

Madhya Pradesh or India as a whole.[2]

Raipur district contains one of the large cities of Madhya Pradesh

and is connected by rail with the bigger cities and also the terminal

markets for some of its rice export (like Bombay, Calcutta and Madras).

The district has seven major primary assembling markets for paddy

and rice. For three of them, viz., Raipur, Baludabazar, and Bhatapara,

we have market arriavls and price data on a more continuous basis than

for the others. During 1959-60 and 1960-61, these three markets

accounted for at least 50 per cent of total arrivals (from villages)

of paddy and rice at the seven major markets taken together.[3] The

three markets are situated wide apart, each fed by trucks and bullock

carts bringing supplies from villages within a radius of about 15-20

miles.

The Raipur District Cooperative Marketing Society (which for

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[1]Second Report On IADP, 1960-64,op. cit., p. 215. We may note
that a survey, during 1958-59, of 56 cultivated households selected
from four villages of Raipur indicated a very similar land distribution
pattern as between the size group below 10 acres and that of 10 acres
and above. See 'Report on Market Arrivals of Foodgrains during 1958-59
Season', by the Ministry of Food and Agriculture, p. 365.

[2]From 16th round of NSS data (1959-60), the per cent of
cultivated area accounted for by holdings of 10 acres and more is
73 per cent of Madhya Pradesh and 60 for India as a whole.

[3]Report on Marketing of Agricultural Produce in Raipur District,
Dept. of Agriculture, Nagpur.

many years used to buy the produce of the cultivator and advance him money against crop pledge) was made a procuring agent of the state government. But its purchases, even as an official procuring agent, has been almost entirely on a voluntary basis.

From these considerations, it seems that proportionate changes in price and in arrivals of paddy and rice at the three selected mandis may be used as an approximate for the proportionate changes in price and marketed surplus for the cultivators of Raipur.

The changes (with 1960-61 as base year) in arrivals from villages and in average price of paddy at the three markets are shown below along with changes in paddy production in the district for the period 1960-61 to 1964-65. The index for P_i is again derived from rural retail prices of cotton clothing, sugar, kerosene oil, and groundnut oil in Madhya Pradesh averaged with their relative weights for rural consumers of Central India (Appendix Table 5)

	S	O_f	$P (= P_f/P_i)$	P_f	P_i
1960-61	100.0	100.0	100.0	100.0	100.0
1961-62	82.9	93.9	101.4	105.3	103.9
1962-63	49.8	67.0	106.7	108.9	102.1
1963-64	73.5	93.9	109.2	120.7	110.5
1964-65	70.6	104.0	114.2	128.4	112.4

The least square linear estimators for the five-year period,

with current year variables, are given by $S = 164.15 + .88 \, O_f - 2.06P \, (R = .945)$.

Elasticity of S with regard to O_f for the given sample is +1.07,

and with regard to P is -2.90.

Introducing the price expectation variable (P_{t+1}/P_t), the marketed

surplus equation consistent with the observations for 1960-61 to

1963-64 (1960-61 as 100) may be calculated as $\hat{S} = 381.8 + 1.47 \, \hat{O}_f$

$- 1.69 \, \hat{P} - 2.59(P_{t+1}/P_t)$, $\wedge$ indicating percentage change.

It is possible to cite some more evidence regarding the negative

response coefficient of S to P in the case of some of the better off

cultivators in the district. This is based on two-year data (1957-58

and 1958-59) collected by Sehore Agro-economic Research Centre

regarding 56 cultivating households selected from four villages in

the hinterland of Raipur market centre.[1]

Half of these households had holdings of more than 10 acres, and

they accounted for 80 per cent of the land cultivated by all the 56

households. For these cultivators, production of paddy increased by

4.5 per cent, and their total paddy receipt[2] (including kind rent,

etc.) increased by two per cent. Paddy sales as reported by them rose

by 13.8 per cent. The cultivators also reported some withholding of

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[1] Report on Market Arrivals, op. cit., pp. 354-368.

[2] For all the cultivators in the district taken together, receipts and payments in kind may cancel each other out, but they may not for a small group of cultivators such as considered here. Hence we may consider receipts of paddy in kind as well as payments of paddy in kind.

marketable surplus in expectation of withdrawal later in the marketing

season of Government control over private export of rice and paddy

out of the district. The reported marketable surplus (reported sales

plus reported stocks withheld for selling later) rose by 50.5 per cent.

Wholesale price of paddy (average for different varieties for October

through June) at Raipur market declined by 22.2 per cent between these

two years, while P_i (obtained approximately from wholesale price indices

of cotton clothing, fuel and light, sugar, and edible oils, weighted

by their relative shares in consumer expenditure in rural Central

India) remained practically unchanged. Using these figures and the

information provided by traders, millers, commission agents, and Govern-

ment officials at Raipur market regarding the proportions of production

sold, consumed and used for payments in kind (50, 38 and 12 per cent

respectively), the elasticity of S with regard to P that can be cal-

culated with expression (II) has the following range of values:

e_{sp} = -1.63 to -2.19, with dS/S = +.505 (p.c. change in marketable

surplus)[1] e_{fa} = 0.4 to 0.8[2], and using alternately the p.c. change

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[1]By considering the changes in the marketable surplus as reported
by the cultivators, it might be possible to partly free the result of
this calculation from the effect of Government restrictions on rice
movements that not only were expected to be temporary but were actually
so. If instead we consider the p.c. change in only the reported sales
by these cultivators, the elasticity of S to P becomes much smaller,
though it still remains negative, ranging from -0.22 to -0.47

[2]We have taken a small lower limit, as it seems likely that
the income elasticity of demand for foodgrains may be smaller for
better-off cultivators with relatively high levels of grain production
and marketable surplus. However, since one may not absolutely be sure
about this, the upper limit is set at the same level as in the
general case.

in production and in total receipt of paddy for dO_f/O_f.

Birbhum district of West Bengal

In this district paddy enjoys an overwhelming importance in
the cropping pattern, accounting for 85-90 per cent of gross sown
area and a similarly high proportion of total value of crop production
and cultivators' income.

According to NCAER estimate for 1960-63, the rural surplus of rice
(allowing for rural consumption at the rate of 165 kg. per capita,
seed and feed) is 33 per cent of rice production in Birbhum. Maximum
prices were statutorily imposed on the wholesale paddy markets of this
and other surplus districts of West Bengal in 1964, and interdistrict
movements of paddy and rice in private account were restricted. On
account of this, the proportionate changes in market arrivals may be
taken to indicate those in marketed surplus only up to 1962-63. We
have studied market arrivals from villages and prices at three markets,
viz., Sainthia, Sirsi, Rampurhat, which account for more than half of
total arrivals of paddy and rice at all the primary wholesale markets
of the district.

For three years the proportionale change in S and $P(P_f/P_i)$ for
the selected markets and in O_f for the district are as indicated below,
with the initial year as base.

	S	O_f	P
1960-61	100.0	100.0	100.0
1961-62	96.3	96.5	112.0
1962-63	56.5	82.7	136.0

Solving for the two unknowns, we get the elasticity of S in relation to

$$O_f \quad : \quad + 4.76$$

$$P \quad : \quad - 1.08$$

As the district more or less satisfies the conditions of our hypothesis, the sign of the elasticity of S to P may be expected to be negative. For the three years considered and with output and relative price of foodgrains as the only explanatory variables, the price response seems to be negative. However, the data in this case are too inadequate to form by themselves the basis of any generalization concerning the likely sign of the response coefficient.

West Godavari District, Andhra Pradesh

Paddy accounts for about 75 per cent of the gross cropped area, 80 per cent of the area under foodgrains as a whole, and more than 80 per cent of the gross value of crop production in this district.

According to the Marketing Survey of West Godavari made by the Department of Food and Agriculture, the marketable surplus of rice

(after subtracting requirements of seed, payments in kind and domestic
consumption by cultivators -- all based on local enquiries) was more
than 50 per cent of production in the bumper crop year of 1963-64.
According to NCAER estimate for the period from 1960 to 1963, rural
surplus (after meeting consumption requirements of the non-agricul-
tural rural people as well) was 31 per cent of rice production. As
for the distribution of themarketable surplus and production of rice
among different size-classes of cultivators, some idea may be
obtained from the fact that 72 per cent of the cultivated area of the
district and 29 per cent of its cultivating households belongs to the
size-group of five acres and above.[1] With 77 per cent of its cropped
area irrigated and with fertile alluvial soil over most parts of the
district, a five acre holding in terms of its yield is much larger in
West Godavari than in the rest of the country.

For three major primary assembling markets of West Godavari (viz.,
Eluru, Tadepalligudem, and Palakol) we have market arrivals and price
data for 1960/61 - 1964/65. These three markets account for 65-70
per cent of total arrivals of paddy and rice at all of the six primary
mandis of West Godavari.[2] Arrivals at these mandis which are spread

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[1]Second Report on IADP (1960-64). op. cit., p. 162. This pattern
of land distribution refers to the IADP blocks of West Godavari
which cover 83 per cent of its gross cropped area.

[2] Report on Marketing of Agricultural Produce in West Godavari,
District Department of Food and Agriculture, Nagpur.

out over the district (each serving villages within a radius of 10-20 miles) account for a major part of marketable surplus of paddy in the district.[1]

Proportionate changes in arrivals and average price (average of paddy and rice in terms of paddy) at the three selected markets are used as approximation for those in marketed surplus and price of paddy in the district. These are given below along with changes in district paddy production.

	S	O_f	$P(P_f/P_i)$	P_f	P_i
1960-61	100.0	100.0	100.0	100.0	100.0
1961-62	72.9	92.6	101.1	104.7	103.6
1962-63	95.0	93.1	95.7	103.2	105.8
1963-64	84.5	113.0	98.4	111.8	113.6
1964-65	112.6	116.0	96.6	108.6	112.4

Source: Appendix Tables 6-7.

For this set of data, the least square linear estimate of marketed surplus equation is $S = 609.4 + .18 \ O_f - 5.42 \ P \ (R=.71)$[2], the

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[1] Report on Marketing of Agricultural Produce in West Godavari, District Department of Food and wgriculture, Nagpur.

[2] If we consider P_f alone instead of P_f/P_i the price variation becomes larger and we get a stronger relationship. The estimated equation then becomes $S = 220.8 + 1.46 \ O_f - 2.63 \ P_f \ (R=0.89)$.

elasticity of S to O_f and P corresponding to this being +.2 and -5.7
respectively. As the variation in P over time is relatively small,
there is not much point in introducing the expected price variable
P_{t+1}/P_t.

A supplementary evidence regarding the negative elasticity of
S to P for some of the better-off cultivators in this area may be
derived from the two-year data collected by the Fram Management
Centre at Andhra University.[1] 36 cultivating households in the
hinterland of Tadepalligudem market centre were surveyed for 1957-58
and 1958-59 (November-June only). Two-thirds of these cultivators
had holdings of more than 5 acres.

For these 36 cultivating households put together, total paddy
receipt (farm production and other receipts in kind) declined by 1.5
p.c. in 1958-59 as compared with 1957-58. Comparing their paddy sales
during November 1957-June 1958 and November 1958-June 1959 (November-
June covers the peak marketing season for both of the two paddy crops
grown in this area), we find that it declined by 23%. In 1958-59
there was reportedly some withholding of marketable surplus by these
cultivators for selling later in the season, which was made possible
partly by increased availability of cooperative credit. If we take
into account the change in marketable surplus (residual after retaining
for seed and household consumption and paying rent and wages in kind)

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[1]Report on Market Arrivals, op. cit., pp. 371-383, Appendix tables
2,3,7.

as reported by the cultivators themselves, then we can largely eliminate the effect of this factor on our calculation. Percent change in this marketable surplus of paddy was $dS/S = -.117$. The proportion of total paddy receipt (β) used for seed and payments in kind was 25 p.c. in 1957-58; the proportion retained for self-consumption was 16 p.c.; marketable surplus as a residual was 59 p.c. This gives $C_f/S = 0.27$ and $O_f/S = 1.70$.

Average price for raw and boiled rice at Tadepallgiudem for the 9-month period November-July rose by 8.4 p.c. Assuming a p.c. change in P_i equal to $+ 0.011$,[1] we get $dP/P = +0.073$.

Assuming the income elasticity of demand for rice on the part of these cultivators to range from 0.4 to 0.8.[2] and using expression (II), the elasticity of S to P for these two years comes to be negative and between -1.37 and -0.38.

A less than 2 p.c. decline in paddy production (as well as in total paddy receipt) led to a 12 p.c. decline in sales - which was made possible at least partly by the rise in price of paddy relative to purchased consumer goods.

Chingleput District, Madras

Rice accounts for 72 p.c. of gross cultivated area of the district,

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[1] The index for P_i, calculated from wholesale price index numbers (all-India) for cotton manufactures, sugar, kerosene and groundnut oil, weighted by their relative shares in consumer expenditure in rural sector of south India (9th and 13th rounds of NSS), rose by 1.1 p.c. from 1958 to 1959.

[2] See footnote 2, p. 36.

and the estimated rural surplus of rice (after allowing for seed and a per capita consumptionof 165 Kg.) is about 25 p.c. of production.

Using the figures of market arrivals and prices at the most important primary paddy and rice assembling market of the district, viz., Kancheepuram, and the paddy production figures for the district, we obtain the following figures for price, marketed surplus and production of paddy during 1960-61 - 1963-64 (with 1960-61 = 100). The data for 1964-65 could not be used because of large gaps in figures of market arrivals.

	S	O_f	P	P_f	P_i
1960-61	100.0	100.0	100.0	100.0	100.0
1961-62	145.9	117.6	106.9	101.7	95.1
1962-63	148.7	127.7	85.3	92.0	107.8
1963-64	144.0	132.4	90.7	106.1	117.0

Note: P_i same as for Tanjore

The following marketed surplus equation seems to be consistent with the given data

$$\hat{S} = 445.7 + .58\ \hat{O}_f + (-2.04)\ \hat{P}_t + (-1.99)(P_{t+1}/P_t),$$

$\wedge$ indicating percentage change in the variable concerned, and the three coefficients being the elasticities of S to O_f, P and (P_{t+1}/P_t) respectively.

Karnal district, Punjab

Rice, wheat and gram together account for about 70 p.c., and foodgrains as a whole for 85-90 p.c., of the total area under all crops (except vegetable, fodder and green manure crops) in the district.

According to NCAER estimate for 1960-63, rural surplus of Karnal (after allowing for seed, feed, and rural consumption) is about one-fourth of its grains production.

From the available data regarding arrivals from villages and prices of rice, wheat and gram at the three largest primary assembling markets of Karnal (viz., Taraori, Thanesar, and Kaithal), and the production data relating to the district as a whole, we derived the following index numbers.

	S	O_f	$P(P_f/P_i)$	P_f	P_i
1960-61	100.0	100.0	100.0	100.0	100.0
1961-62	146.6	98.4	93.3	91.6	98.2
1962-63	100.6	80.2	92.7	97.0	104.6
1963-64	123.2	81.5	106.9	113.0	105.7
1964-65	116.8	109.2	116.6	136.3	116.9

(P_i is derived from rural retail prices in Punjab for the 4 items of consumer goods, weighted by their relative shares in consumer expenditure in the rural sector of Northwest India). Source: Appendix Tables 10,11.

One can summarize this set of observations with the linear

regression equation:

$$S = 117.6 + .32\ 0_f - .49\ P \quad (R=.23)$$

Though the evidence in this case is very much weaker than

in the earlier cases, it still points to a negative response of

S to P.

So far we have studied some of the cases which more or less

satisfy all the four conditions of our hypothesis. We may now study

the price response of marketed surplus in a few contrasting cases

which do not satisfy some of the conditions that the earlier cases

do.

Hissar District of Punjab 1955/56 - 1960/61

For the period studied here the district was not a surplus

producing one, and most of the cultivators were very poor even in terms

of their grain production. It is not until the beginning of the

Second Plan period that the increase in irrigation facilities had

a substantial impact on the agrarian economy of the region, through

raising yield of foodgrains and through rendering commercial crops

like cotton and sugarcane important. On the basis of data collected

by the Ministry of Food and Agriculture, Government of India, and the

Punjab Board of Economic Inquiry,[1] we find that marketed surplus

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[1] 'Effects of Bhakra Dam Irrigation on the Economy of the Barani
villages in the Hissar District; issued by the Punbaj Board of Economic
Inquiry.

is negatively related to both relative price and output of foodgrains. O_f here refers to production of the major foodgrains in the district, P to index numbers of average harvest price for the three major grains (wheat, gram and bajra) at seven major wholesale markets of the district[1] relative to a comprehensive index of 'prices paid' by cultivators in all-Punjab (prepared by the Punjab Board of Economic Enquiry). S refers to changes in arrivals of the three foodgrains at these wholesale markets. Expressed as percentages of 1955-56 figures, the data are as follows.

	S	P	O_f	P_f	P_i
1955-56	100.0	100.0	100.0	100.0	100.0
1956-57	138.6	76.6	93.5	85.9	111.9
1957-58	106.7	115.0	92.8	130.0	112.9
1958-59	88.1	92.1	119.2	118.2	128.2
1950-60	163.1	93.2	101.0	117.8	126.4
1960-61	119.0	100.8	114.8	127.0	126.0

Source: Appendix Table 15

For this set of data a log-linear equation seems to give a better fit than a simple linear one, and the estimated coefficients are given by:

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[1] Hissar, Sirsa, Dabwali, Hansi, Bhiwani, Lohaur and Uklana.

$$\log S = -.453 \log O_f - .755 \log P \quad (R=.499) \quad .$$

Negative price response of marketed surplus in this case is not due to the reasons that are true of the earlier cases. Pre-1960 Hissar - with a crop pattern dominated by subsistence requirements, with little rise in foodgrains production and most of the cultivators very poor - seems to constitute an illustration of the 'fixed cash requirements' theory. To purchase the minimum necessities and pay the dues the peasants had to sell some grains that they would rather consume. With increase in production and/or price of foodgrains, meeting unfulfilled requirements of grain consumption assumed primary importance and the extent of 'distress sales' declined. Pre-1960 Hissare may belong to the past (Bhakra irrigation has transformed the agrarian economy since then), but many similar cases exist in most parts of the country, especially in Bihar, Uttar Pradesh and Gujarat. Given the egalitarion objectives of development there is little case of price policy to raise the marketed surplus of foodgrains in such cases.

Balasore: A rice surplus district of Orissa

Balasore is a predominantly rice growing (75-80 p.c. of its gross cropped area under paddy) and rice surplus district. But the agricultural sector in this case has been much less exposed to seepage of wants from the urban sector than in the cases studied earlier

in this section. The reason is the smaller degree of industrialization, urbanization and the generally lower level of per capita income in this region: in 1961 only 6.3 p.c. of total population of Orissa lived in cities, as compared with 18 p.c. for India; in Balasore urban population was 6.5 p.c. of total population of the district; during 1960-61 per capita income of Orissa was about 20 p.c. below all-India per capita income and 40 p.c. below that of West Bengal.

The following calculations may roughly indicate the nature of price response of marketed surplus under this condition.

Visva-Bharati Agro-economic Research Centre collected some data[1] relating to 48 cultivating households in the hinterland of Bhadrak market centre of Balasore for 1957-58 and 1958-59. Half of these households belonged to the size group of 5 acres and above. For these cultivators, total receipt of paddy (farm production and other receipts in kind) rose by 79 p.c. The large rise reflected not a bumper crop in 1958-59 but a very poor one in 1957-58. Paddy sales from October up to July during the 1958-59 marketing season was 138 p.c. larger than the volume of sales during 1957-58. By July most of paddy marketing is usually over in Orissa; and though the cultivators reported some stocks in July (apart from their retention for household consumption and kind payments) most of it was precautionary stocks which were depleted by the abnormally poor crop of the preceding year when nearly

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[1]Report on Market Arrivals, 1958-59 season, op. cit. pp. 213-22, 157-173.

85 p.c. of the total receipt of paddy was used for household consumption

and stocks and various payments in kind were reduced to the absolute

minimum. The largest part of the increase in production in 1958-59

thus went into replenishing precautionary reserves, raising payments

in kind and providing for the cultivators themselves an ample consump-

tion. For this reason, we have to consider the rise in β (from 6 p.c.

of total receipt in 1957-58 to 20 p.c. in 1958-59), and we have to

assume a larger than usual income elasticity of demand for foodgrains

on the part of the cultivators.

The price for paddy received by cultivators in this area was

affected by two measures adopted by the Government during 1958-59.

One was Government nomopoly over paddy export from Orissa to other

states, and the other was Government purchase of paddy at a controlled

support price. The first one tended to depress the price in a surplus-

producing district like Balasore. At the same time the prices did not

decline as much as they would have in the absence of Government purchases.

Price of common paddy at Bhadrak market declined by 9.7 p.c. in 1958-

59 as compared with 1957-58. The price paid by them for consumption

purchases probably rose slightly[1] over the same period, making the

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[1]The index number of prices paid (for consumption purchases as well as for inputs) by Orissa farmers was 7.4 p.c. larger in 1958-59 compared with the preceding year. (Source: Agricultural Situation in India, April, 1960). The rise in prices paid for consumption purchases alone was probably smaller than this. The rise in the working class consumer price index at Cuttack city, for example, was only 1.7 p.c. between 1958 and 1959. If we consider the decline in price of rice, and the weight of rice in urban consumer expenditure of Orissa (about 30 p.c. from 13th Round of NSS), then the rise in

decline in P between 10 to 15 p.c.

Assuming an income elasticity of demand for foodgrains on the part of these cultivators ranging between 0.6 to 0.8, the elasticity of S to P (net of the effect of changes in real income on marketed surplus) turns out to be positive for this two-year period. It is because of the fact that the rise in production came after an abnormally poor crop, and *because* the seepage of wants from urban to rural areas has been relatively small in Orissa, that we obtain a large positive price elasticity of marketed surplus even though these cultivators are relatively prosperous and derive most of their purchasing power from selling paddy. As the cultivator's total real income and the consumption of rice declined considerably in the preceding year, and as not many manufactures had yet become necessities for them, what assumed primary importance was recovering rice consumption, replenishing reserves and paying accumulated dues. Rise in sales was less than one-fifth of the rise in total amount of paddy received by these cultivators.

Ministry of Food and Agriculture data for 1960/61 - 1964/65 also seem to indicate a positive price response of marketed surplus in Balasore. Using total arrivals of paddy from villages and average

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urban (Cuttack) cost of living index excluding rice was not more than 6 p.c. The rise in rural cost of living might have been even smaller, because of smaller importance of transport and housing cost.

price of paddy at three primary assembling markets (viz., Balasore,

Chandbali, and Bhadrak), the paddy production figures for the district

as a whole, and deriving the index for P_i from rural retail prices in

Orissa of four major purchased items averaged with their relative

weights for rural east India, we obtain the following index numbers

for Balasore district.

	S	O_f	P	P_f	P_I
1960-61	100.0	100.0	100.0	100.0	100.0
1961-62	176.9	85.0	108.7	108.9	100.2
1962-63	100.7	84.1	121.4	128.3	105.7
1963-64	173.4	99.5	114.2	127.9	112.0
164-65	136.5	110.4	108.9	131.5	120.8

Source: See Appendix Tables 12,13.

In view of the smallness of the marketed proportion of production

in this district,[1] the poor withholding capacity and bargaining strength

of cultivators due to lack of credit and the trader dominated paddy

markets, it seems that expected price is much less likely to affect

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[1]About 14 p.c. in 1958-59, for the 48 cultivators studied by
Visva-Bharati Agro-economic Research Centre. According to K.S. Rao's
estimate (Agricultural Situation in India, October 1960), exportable
surplus of Balasore district (after feeding its small urban population)
was 13.5 p.c. of paddy production during 1955-58.

sales than in other cases; and it seems that the level of preceding

year's output is likely to have a more important effect.

Solving the five-year data given above for the three unknown

coefficients, one obtains $\hat{S} = 6.09 \ \hat{0}_f + 2.16 \ \hat{P} + 5.03 \ (\hat{0}_{f,t-1})$, $\wedge$

indicating the percentage change in the variable concerned from one

year to another, and $0_{f,t-1}$ being the index number paddy production

for the preceding year.[1]

The price elasticity again is positive, and relatively small

as compared with the effect of current and preceding year's output on

marketed surplus.

Adjustments in the price-ratio between foodgrain and purchased

manufactures may be effective in raising the marketed surplus only

when the latter are of considerable importance in the consumption

pattern of cultivators. The very high levels of per capita consumption

of cereals in rural Orissa is not entirely due to the low income of

the generality of cultivators in this area. Even for similarly high

income groups, per capita cereal consumption (rural) is higher in Orissa

than in West Bengal, Punjab or Andhra Pradesh.[2] Poor transportation

facilities is partly responsible for this. Better transportation

and larger rice trade with neighbouring deficit states would raise the

price and the income received by the cultivators, reduce cereal consumption

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[1] Which was 77.1 for 1959-60 with 1960-61 as 100.

[2] Agricultural Labour Enquiry Committee Report; 1950-51 and 1955-56

of the better-off cultivators in this state, generate demand for more
manufactured consumer goods and also increase their availability in
the rural areas.

Ferozepure and Amritsar districts of Punjab

These districts are not only large producers of foodgrains with
considerable surplus,[1] but they also have a considerable proportion
of acreage under commercial crops, mainly cotton. Of the total acreage
under crops (excepting vegetables, fodder and green manure crops)
wheat and gram (which are the most important foodgrains grown in
this area) account for about 60 per cent in Ferozepur and about 50
per cent in Amritsar, while the percentage accounted for by cotton
is 20 and 13 respectively.[2]

As commercial crops are important in these cases and as cultiva-
tors' purchasing power is relatively less dependent on grain sales,
they are more likely than not to reduce the sale of foodgrain if its
price declines relative to purchased items (unless their income from
the other crops declines significantly at the same time). In other

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[1]According to NCAER estimate for 1960-63, rural surplus of food-
grains (allowing for a per capita consumption of 165 Kg., and
for seed, feed, wastage) is slightly less than one fifth of
grain productionin Amritsar and slightly more than one third
of grain production in Ferozepur.

[2]These figures refer to 1964-65 and are taken from Statistical
Abstract of Punjab.

words, in such a case we may expect to find under normal production conditions, a _positive_ relation between S and P_f/P_i (net of the influence of changes in O_f _and_ of changes in the income from commerical crops.)

Our data are far from adequate for considering all the relevant variables in such a case. However, a rough idea of the nature of the price response in question may be derived from a consideration of some important variables. To take account of the influence of changes in price and output of the commercial crop we have included as a variable the index number of value of production of cotton deflated by the index number of prices paid for purchase of manufactures in the same manner as the index number of foodgrain price is deflated. This new variable is $Y_c (=O_c \cdot P_c/P_i)$.

For Amritsar, using five-year data regarding market arrivals and average price of wheat and gram at two major assembling markets[1] of the district, price of cotton at the same markets, and production of wheat, gram and cotton for the district as a whole, and an index of P_i for Punjab,[2] we obtain the following index numbers for changes in S, O_f, P_t, P_{t+1}/P_t and Y_c.

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[1] Tarn Taran and Amritsar

[2] Same as that used in the case of Karnal district of Punjab, and as described in Appendix Table 11 .

	S	O_f	P_t	Y_c	P_{t+1}/P_t	P_f	P_i	P_c	O_c
1960-61	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1961-62	163.9	122.4	100.9	115.6	94.4	99.1	98.2	87.7	129.4
1962-63	154.8	125.7	96.2	97.6	113.6	100.6	104.6	79.6	128.3
1963-64	145.4	117.5	110.3	103.3	108.7	116.6	105.7	96.5	113.2
1964-65	133.7	168.3	121.0	142.5	102.6	141.5	116.9	101.3	164.4

Source: Appendix Tables 11,14

Solving for the unknowns in the set of four equations relating

the percentage changes in the variables for the given sample, we obtain

a positive sign of dependence of S on O_f and P_t and a negative one for

that of S on P_{t+1}/P_t and Y_c. The absolute values of the elasticity

coefficients thus calculated are very large in this case:

$$\hat{S} = 12.7\ \hat{O}_f + 8.3\ \hat{P}_t - 22.4\ \hat{Y}_c - 31.5\ (\hat{P}_{t+1}/P_t),$$

$\wedge$ indicating percentage change in the variable concerned. These high

response coefficients may be because of some other varible being left

out which might have affected the marketed surplus in some of the years

under consideration. The unusually high absolute values of the

elasticities are puzzling; but the signs of the coefficients seem

plausible enough in view of the conditions of the case: a rise in

grain production tends to raise the surplus, a rise in the income

from other crops tends to raise retention out of any given production

of grains, an expected rise in price for the next year relative to the

current year tends to encourage withholding of stocks, and as foodgrain

does not constitute the predominant source of income a decline in

its price relative to items to be purchased may not lead the cultivator

to cut on his retention in order to obtain the other items.

Coming to Ferozepur, we studied the data collected by the

Agricultural Economics Research Centre at Delhi University in

respect of 68 cultivating households in Moga tehsil for 1957-58 and

1958-59.[1] With this two-year data we tried to calculate the price

elasticity of marketed surplus by using a modified version of expression

(II) so as to take account of changes in price and output of cotton.

Unfortunately, the survey report gives sales figures for wheat alone,

and as gram is an important foodgrain in this case (gram production

amounting to about one fifth of wheat production in the case of the 68

cultivators under consideration) our calculation is handicapped for this

reason. Although much importance may not be attached therefore to

the result in this case, we may note that assuming changes in price,

production and sales of foodgrains to be roughly represented by those

of wheat alone (which constituted in both the years about 76 per cent

of total grain production for the 68 cultivators), we obtain a positive

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[1]Report on Pace and Pattern of Market Arrivals, op. cit., pp. 48-
54, 82, 84-86. Of the 68 cultivators surveyed 36 have holdings of
20 acres and above, and 15 have holdings of 10-20 acres. So the sample
is dominated by richer cultivators.

response of S to P ($=P_f/P_i$) for wheat. Though our available data
do not provide enough evidence, this is what seems likely because
though these cultivators are prosperous and their demand for purchased
consumables may be large, they are not primarily dependent on sales
of wheat for obtaining their purchasing power. If grains become
cheaper relative to purchased consumables, they may sell less out of
a given foodgrains productionand still maintain or even raise their
consumption of other items if their income from cotton, etc. increases
at the same time.

The few contrasting cases studied above indicate some of the points
we have made regarding the price response of the marketed surplus. In
the cases where commerical crops are important (Ferozepur and Amritsar,
for example) or where because of poor transportation and low urbanization
in the adjacent areas the manufactured consumables are not very important
in the farmers' budget (Balasore, for example),one might not expect a
rise in price of purchased consumables relative to foodgrains
to raise grain sales. In the case of pre-1960 Hissar, though we get
a negative respone of sales to relative price, this may have more to
do with the mainimum cash requirements or dues of the very poor
peasants, and as such may not be relevant from the policy point
of view we are trying to focus on.

III

Despite the limited number of cases studied and the limitations
and inadequacies of the data which limited the method of analysis
that could be employed, the preceding section provides some
empirical evidence in favour of the hypothesis regarding the conditions
under which the response of marketed surplus to changes in the price
of foodgrains relative to purchased consumer goods may be negative.
The conditions are that (a) grain production in a region is consider-
ably in excess of the retention (for consumption, seed, kind payments)
requirements of cultivators, (b) the major part of this marketable
surplus is held by better-off cultivators with holdings above 5-10
acres (depending on conditionof soil), (c) the cultivators have been
exposed to a considerable seepage of wants from the urban sector, and
(d) foodgrains predominate in the cropping pattern and constitute
the predominant source of income for the cultivators. We studied
some cases which fulfill these conditions and also some which do
not, and we tried to explain the differences in the response of marketed
surplus to changes in this price ratio.

Our conclusion is that under these conditions and given other
things, it might be possible to raise the marketed surplus and the
real savings ratio of the richer cultivators by means of reducing
P_f/P_i. This may, of course, be achieved either by reducing P_f or
by raising P_i. But the latter may be preferable, because in that

case it may be possible to control the impact on different groups of cultivators, while reducing P_f is a blanket measure affecting large farmers as well as the small who may not have much mobilisable surplus. Secondly, reducing P_f to any significant extent also involves the risk of influencing the cultivators' allocation of land and other inputs against foodgrains and in favour of the higher priced commercial crops. The items that may be taxed for the rural sector to raise P_i selectively are those that are in high demand among more prosperous cultivators and in more prosperous agrarian regions. Some of them are: clothing (except the coarser varieties), shoes, sugar, most of the manufactured consumer durables like bicycles, sewing machines, radios, and amusements like cinema.

One may wonder about what should be the means for regulating the prices to be paid by cultivators for the selected manufactured consumer goods. This question, which involves administrative issues, is beyond the intended scope of this study, and we do not propose to go into any details of this question. A possible instrument may be (particularly in the case of the items that are manufactured on a large scale) that of imposing excise duties on these items with regard to specific areas or maybe in general (as the items to be taxed are consumed mainly by the rich cultivators, even a general excise tax may not hurt the poor regions or the poor peasants in a rich region). A possible instrument for the administration of such taxation might also lie in delegating part of the rural retail distribution of the selected

manufactures to cooperative marketing societies or the State Trading

Corporation[1] (perhaps using the cooperatives or private traders as its

selling agents alongside their existing role as its buying agents).

It is not much use multiplying such general comments regarding the

implementation of the price policy. The administrative problems in

different areas and the question of the measures for solving them

are important and complicated enough to deserve a separate study.

The question of the <u>extent</u> of change in P_f/P_i is as important

as the direction of this change. A large and sudden rise in P_i may

not call forth the expected response in marketed surplus. This is all

the more likely if the rise in P_i is expected to be temporary. A

slow and steady rise in P_i relative to P_f is likely to be more effective,

At least that is what seems plausible from common observation and from

the response of Soviet cultivators to the violent but short-lived rise

in prices of manufactured consumables during the period frommiddle of

1922 to the end of 1923.

In cases where commercial crops other than foodgrains account

for a major proportion of total cultivated area (with the three other

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[1]It is interesting to note that in the Soviet 'industrialisation
controversy' of late 1920's Preobrazhensky suggested that for the purpose
of mobilising agricultural surplus the prices charged by the State
for manufactures purchased by cultivators should be raised;
see E. Preobrazhensky, The New Economics, (translated by Brian
Pearce), 1965.

conditions satisfied), a decline in P_f/P_i may raise S only if the price

ratio between foodgrains and these other crops has not moved against

foodgrains. A rise in price of commercial crops relative to foodgrains

would reduce the marketed surplus out of any given production of grains

by raising his income and hence demand for foodgrains and by lessening

his need for selling grains to obtain more of the purchased consumer

goods. This implies that price control for foodgrains without similar

control for the competing commercial crops is likely to affect the

marketed surplus adversely.[1]

The question of raising marketed surplus of foodgrains by means

of price policy is important mainly in the short run (of, say, the next

10 to 15 years). In the long run, after the investments in the agricul-

tural sector start bearing fruit on a large scale, marketed surplus

is likely to rise substantially through production growing ahead of

population. Any short-run price policy for raising marketed surplus

should not conflict with this long-run objective. If one is very

careful and selective in choosing the instruments of <u>relative</u> price

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[1]A somewhat similar phenomenon is that if in a region two or three
foodgrains are of nearly equal importance in the cropping pattern of
a particular season (e.g., wheat and gram in Punjab; rice and jowar
in some districts of Andhra Pradesh and Madras), and if there is price
control for, say, wheat with the price of the coarser grain (say, gram)
rising relatively, the cultivators may substitute wheat for gram in
home consumption and payments in kind thus reducing marketed surplus
of wheat. In other words, this partial price control may defeat the
purpose (based on preferences of urban consumers) of raising marketed
proportion of production of superior cereals more than that of the
coarser ones. This phenomenon was observed in Western Uttar Pradesh
in 1958-59.

policy, one may be able to raise marketed surplus and at the same time to maintain production incentives. We have already suggested the possibility of raising P_i absolutely through sales tax (for certain selected items) as a way of reducing P_f/P_i. As discussed earlier, in the Indian context a change in P_f/P_i may not significantly affect O_f. What affects O_f more directly and strongly is P_f/P_c. A possible adverse shift in P_f/P_c from the production incentive point of view for foodgrains may be partly counteracted by suitable crop-specific input subsidies (like subsidized fertiliser supplies tied, if necessary, with fertiliser-consuming varieties of seeds, etc.).

One thus has to distinguish between the two sets of prices paid by cultivators: prices of purchased inputs and those of purchased consumables. Though, theoretically, the question of the response of marketed surplus to changes in price-ratio between foodgrains and purchased consumables is parallel to the question of its response to changes in price ratio between foodgrains and purchased inputs, the policy implications are quite different, not merely because the response coefficients may be quite different in the two cases but more significantly for three other reasons. First, if raising the price-ratio between purchased consumables and foodgrains leads to a rise in the marketed surplus, this stands for a rise in the cultivators' real savings ratio; but a similar response to a rise in price ratio between say, fertilisers and foodgrains may instead imply a decline in investment in this input and perhaps also a decline in cultivators'

total savings. This leads to the second point: a rise in price-ratio between inputs and foodgrains may affect production, but a similar rise in price ratio between purchased consumables and foodgrains is unlikely to affect production (unless the price-ratio between food-grains and alternative crops changes at the same time). Third, raising fertiliser price for increasing marketed surplus is much more of a blanket measure than raising prices of selected manufactured consumer goods, in the sense that the former's impact may not be restricted among the larger farmers who account for most of the mobilisable surplus.

Tanjore District, 1960/61-1964/65

Table 1

Total arrivals from villages and average price of paddy and rice (in terms of paddy) at 8 markets, and Production of paddy in Tanjore District.

	Arrivals (000 Quintal)	Price (Rs/Quintal)	Production (000 Quintal)
1960-61	1756.4	38.84	13672.1
1961-62	1868.2	38.58	15228.6
1962-63	2154.2	35.80	13656.8
1963-64	1772.5	43.36	12621.5
1964-65	1918.7	39.94	14735.7

Note: The price figures are obtained as weighted averages of prices of paddy and rice at the 8 centres, using the volumes of arrivals as weights.

Source: Ministry of Food and Agriculture, Directorate of Economics and Statistics.

Table 2

Index numbers of P_i for Madras weighted average rural retail price indices (for Madras) of four items (1960-61 = 100).

	Clothing [a]	Kerosene Oil	Edible Oil [b]	Sugar	P_i
1960-61	100.0	100.0	100.0	100.0	100.0
1961-62	99.3	102.7	63.4	99.2	95.1
1962-63	109.8	116.2	87.5	98.4	107.8
1963-64	111.6	140.5	86.8	95.2	117.0
1964-65	103.2	135.1	122.3	98.4	117.2

Relative weights: Clothing   .41
(for South India   Kerosene   .36
as a whole, from   Edible Oil   .15
9th round of NSS)   Sugar   .08
                                1.00

(a) refers to the price of one pair cotton dhoties, one pair cotton sarees, and one metre mill-made longcloth.
(b) refers to groundnut oil.

Sources: Prices and Cost of Living Division, C.S.O., Dept. of Statistics.

Chingleput district, 1960/61 - 1963/64

Table 3

Arrivals from villages and price of paddy (and rice in terms of paddy) at Kancheepuram market, and production of paddy in Chingleput district.

	Arrivals(000 Quintals)	Price(Rs/Quintal)	Production(000 Quintals)
1960-61	434.1	36.51	5161.3
1961-62	633.4	37.12	6067.1
1962-63	645.3	33.58	6592.4
1963-64	625.2	38.73	6836.0
1964-65		40.34	6844.8

Source: Same as for Table A.5.3

Index numbers of P_i used for Chingleput are the same as for Tanjore. Because of large gaps in market arrivals data for 1964-65, we have not used them.

Raipur district, 1960/61 - 1964/65

Table 4

Total arrivals from villages and average price of paddy at three markets, and production of paddy in Raipur district.

1960-61	1735.5	29.68	9847.5
1961-62	1438.7	31.21	9249.2
1962-63	864.3	32.33	6598.5
1963-64	1275.1	35.83	9247.7
1964-65	1225.0	38.10	10244.9

Notes and Source: Same as for Table A.5.3

Table 5

Index numbers of P_i for Madhya Pradesh : weighted average of rural retail price indices of four items with 1960-61 = 100.

	Clothing	Kerosene Oil	Groundnut Oil	Sugar	P_i
1960-61	100.0	100.0	100.0	100.0	100.0
1961-62	104.1	104.2	108.1	97.6	103.9
1962-63	102.3	106.2	90.7	100.8	102.1
1963-64	105.1	122.9	100.8	104.1	110.5
1964-65	111.1	114.6	114.2	108.9	112.4

Weights: Clothing: .44
               Kerosene: .34
               Edible Oil: .12
               Sugar: .10

Source: Same as for Table A.5.4

West Godavari, 1960/61 - 1964/65

Table 6

Total arrivals from villages and average price of paddy at Eluru, Palakol, and Tadepalligudem, and production of paddy for West Godavari.

	Arrivals (000 Quintals)	Price (Rs/Quintal)	Production (000 Quintals)
1960-61	1839.3	36.15	7595.7
1961-62	1340.7	37.86	7033.9
1962-63	1748.1	37.31	7072.0
1963-64	1554.0	40.42	8585.4
1964-65	2071.8	39.25	8810.7

Note: For Eluru, market arrival and price figures are not available for 1960-61. We have assumed that percentage differences, in market arrivals and price respectively, between 1960-61 and 1961-62 for Eluru were the same as for Palakol and Tadepalligudem taken together. This assumption is quite consistent with the comparative behaviour of arrivals (and price) between the three markets for the other years. For averaging prices, arrivals at the different markets are used as weights.

Source: Ministry of Food and Agriculture

Table 7

Index numbers of P_i for <u>Andhra Pradesh</u>: weighted average of rural retail

price indices (for Andhra Pradesh) of four items; 1960-61 = 100.

	Clothing [a]	Kerosene Oil	Edible Oil [b]	Sugar	P_i
1960-61	100.0	100.0	100.0	100.0	100.0
1961-62	105.8	104.6	100.9	92.6	103.6
1962-63	108.5	111.6	89.3	96.3	105.8
1963-64	114.5	125.6	93.3	93.4	113.6
1964-65	107.2	118.6	119.1	98.5	112.4

Weights: Same as in the case of Madras (from 9th Round NSS for rural South India).

(a) and (b): See Note to Table A.5.4

Source: Same as for Table A.5.4

<u>Birbhum 1960/61 - 1962/63</u>

Table 8

Arrivals and average price of <u>rice</u> (and of paddy in terms of rice) at the

selected markets, and the production of rice in the district.

	<u>Arrivals(000 Quintals)</u>	<u>Price(Rs/Quintal)</u>	<u>Production(000 Quintals)</u>
<u>Birbhum (3 markets)</u>			
1960-61	837.1	53.24	4161.5
1961-62	805.9	60.46	4017.4
1962-63	473.3	76.22	3440.8

Note: The weights used for averaging prices are the arrivals at the different markets.

Source: Same as for A.5.3

Table 9

Index numbers of P_i for West Bengal: weighted average of rural retail prices indices (for West Bengal) of four items.

	Clothing	Kerosene Oil	Mustard Oil	Sugar	P_i
1960-61	100.0	100.0	100.0	100.0	100.0
1961-62	101.3	100.0	105.1	100.0	101.4
1962-63	104.5	106.7	107.0	101.6	105.3

Weights:	Clothing	.43
(From 9th	Kerosene	.32
Round of NSS	Edible Oil	.16
relating to	Sugar	.09
rural East India)		1.00

Karnal district, 1960/61 - 1964/65

Table 10

Arrivals of rice, wheat, and grams at 3 markets (Taraori, Thanesar, Kaithal), their average price* at these markets, and production of rice, wheat and grain for the district as a whole.

	Arrivals(000 Quintals)	Price(Rs/Quintal)	Production(000 Quintals)
1960-61	745.0	42.77	5541.9
1961-62	1091.9	39.18	5450.5
1962-63	749.3	41.50	4445.7
1963-64	918.0	48.32	4516.7
1964-65	870.2	58.30	6049.4

*Weighted average price of rice, wheat and grams, for the 3 markets, using their arrivals figures as weights.

Source: Ministry of Food and Agriculture

Table 11

Index numbers of P_i for Punjab: weighted average of rural retail price indices.

	Clothing and Footwear	Kerosene Oil	Mustard Oil	Sugar	P_i
1960-61	100.0	100.0	100.0	100.0	100.0
1961-62	95.7	100.0	102.7	99.1	98.2
1962-63	100.7	110.4	110.3	102.6	104.6
1963-64	90.7	120.8	111.6	112.9	105.7
1964-65	106.2	118.7	159.4	119.8	116.9

Note: 'Clothing and Footwear' covers 5 metres of millmade long cloth, 1 pair of dhoties, 1 pair of sarees, and 2 pair of shoes.

Weights:		
(From 9th	Clothing and Footwear:	.42
Round of NSS	Kerosene Oil	.28
for rural	Edible Oil	.08
Northwest	Sugar	.22
India.)		1.00

Source: Same as for Table A.5.4

Balasore district, 1960/61 - 1964/65

Table 12

Arrivals and average price of paddy at 3 markets (Chandbali, Bhadrak, Balasore) and production of paddy in the district.

	Arrivals(000 Quintals)	Price(Rs/Quintal)	Production(000 Quintals)
1959-60			3944.4
1960-61	462.6	27.94	5115.9
1961-62	818.6	30.44	4347.7
1962-63	466.0	35.86	4304.1
1963-64	802.1	35.75	5091.0
1964-65	631.6	36.74	5649.1

Note and Source: Same as before.

Table 13

Index numbers of P_i for Orissa: weighted average of rural retail prices
(for Orissa) of 4 items.

	Clothing	Kerosene Oil	Mustard Oil	Sugar	P_i
1960-61	100.0	100.0	100.0	100.0	100.0
1961-62	99.5	100.0	103.3	98.5	100.2
1962-63	103.8	108.0	108.8	100.8	105.7
1963-64	106.1	124.0	108.4	103.8	112.0
1964-65	111.3	122.0	155.8	100.0	120.8

Weights same as for Table A.5.12

Amritsar district, 1960/61 - 1964/65

Table 14

Arrivals of wheat and grain at 2 markets (Amritsar and Tarn Taran); average
price of wheat and gram, and of cotton at these markets; production of
wheat and gram, and cotton in the district.

	Arrivals of Wheat & Gram (000 Quintals)	Price of Wheat & Gram (Rs/Quintal)	Production of Wheat & Gram (000 Quintals)	Price of Cotton (Rs/Quintal)	Production of Cotton (000 Quintals)
1960-61	209.3	40.73	1857.4	94.56	65.9
1961-62	343.1	40.38	2273.6	82.90	85.2
1962-63	324.0	40.96	2334.5	75.26	8 .5
1963-64	304.6	47.50	2182.2	91.22	7 .6
1964-65	279.9	57.64	3126.2	95.79	108.3

Source: Ministry of Food and Agriculture

Hissar district, 1955-56 to 1960-61

Table 15

Total arrivals of gram , wheat and bajra at 7 markets; their average price

and production; index of prices paid.

	Arrivals (S) (000 Maunds)	Price (P_f) (Rs/Maund)	Production (O_f) (000 Maunds)	'Prices paid' by Punjab Cultivators (1955-56 = 100)
1955-56	3405.6	10.38	20647.9	100.0
1956-57	4717.9	8.91	19313.2	111.9
1957-58	3636.2	13.48	19176.9	112.9
1958-59	3001.8	12.25	24624.9	128.2
1959-60	5552.4	12.21	20865.8	126.4
1960-61	4051.6	13.17	23698.8	126.0

Note: Arrivals of wheat, gram and bajra refer to 7 markets, viz., Hissar, Sirsa, Dabwali, Hansi, Bhiwani, Loharu, and Uklana. P_f is based on simple average of prices of each grain at the different markets, weighted by that year's production figures for these grains.

Sources: Punjab Board of Economic Enquiry: publications on "Economic Effects of Bhakra Dam Irrigation on the Barani Villages of Hissar District," and on "Parity between Prices Received and the Prices Paid by Farmers in Punjab." The production figures are those issued by the Ministry of Food and Agriculture.